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# Personality, Undergraduate Training and Occupation: An Application of Holland's Theory of Careers

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An Application of Holland's Theory of Careers


## ABSTRACT

Using Holland's theory of careers, this paper explores the relationship among personality, undergraduate training and occupational choice. Data from the NORC longitudinal study of 1961 college graduates permit multivariate analyses of the congruence among personality types, college majors and occupations, and the extent to which incongruities lead to shifts in occupation following graduation. Preliminary results provide some support for Holland's theory, but also suggest the need to consider structural characteristics of undergraduate majors and occupations.

## INTRODUCTION

> Vocational satisfaction, stability, and achievement depend on the congruence between one's personality and the environment (composed largely of other people) in which one works (Holland, 1973: 9).

Since its introduction in 1959, Holland has extended and revised his theory of vocational choice to become a theory of careers. Although the theory continues to address issues of vocational choice, it now also considers determinants of later occupational satisfaction, stability and achievement. In its third formaulation (1973) Holland presents his extended theory of careers along with clearly delineated hypotheses. Major concepts are given empirical definition so that the theory now lends itself to test through an examination of individuals' occupational behavior over time.

### A Brief Review of the Theory

Holland's work builds on four working assumptions to produce a theory of both persons and environments[1]. The first of these concerns the categorization of persons into six types: realistic, investigative, social, conventional, enterprising and artistic. Although these are ideal types and the extent that persons might approximate any one type will vary, most people come to resemble one of these types more than others. This resemblance is a product of a variety of cultural and personal factors, including peers, parents, social class, culture and physical environments, which interact to produce individual interests and competencies. Such personal dispostions

become an important component of personality.

The comparison of individual attributes to the ideal types of Holland's typology leads to the construction of a personality profile. One of several sources of information are often used to estimate this profile: scores on selected scales from interest and personality inventories, choice of vocation or field of training, work history or history of pre-employment aspirations, or a combination of these data. Personality profiles constructed by these methods often allow for the recognition of primary, secondary and tertiary resemblance(differentiated by degree of resemblance, not kind). For instance, information about one's personal dispositions may indicate a pattern of similarity and dissimilarity to the six ideal types so that the individual is estimated to be primarily social, secondarily enterprising, and finally, conventional. These resemblance, in detlining importance, are then the key to understanding this individual's vocational behavior.

Paralleling Holland's assumption of six personality types is that of six kinds of environments. "Each environment is dominated by a given type of personality, and each environment is typified by physical settings posing special problems and stresses" (1973: 3). Each vocation attracts and retains people with similar personalities. These people, in turn, become a significant component of the environment, creating the atmosphere of work and setting standards of achievement. The estimation of environment types is determined through a consideration of the personality types dominating the environment and the physical and social constraints on interaction. The size and complexity of an environment makes the estimation difficualt, however the use of a gross classification - perhaps limited to primary and secondary dimensions - is supported in the available research (cf. Astin and Holland, 1961;

Astin, 1968; McCormick, Jeanneret and Mecham, 1972; among others).

Holland views vocational choice as a developmental process whereby people attempt to implement their self-concept (cf. Super, 1972). His third working assumption is a direct extension of this view. "People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles" (1973: 4). Holland's fourth assumption is then actually a conclusion drawn from a consideration of the previous three; yet it goes further. Vocational and occupational behavoir are determined by the interaction between personality and the working environment, as characterized by Holland's typology. The matches and mismatches of personality and environment forecast occupational satisfaction, stability and achievement. Occupational behavior is therefore determined by this pairing, and the dynamic behind change is the attempt to attain congruence between personality and environment.

Two Currents of Research

This theory of careers has generated an extremely large volume of empirical literature. In his 1973 book, Holland reports there were over one hundred studies offering evidence for the usefulness of the theory and classification scheme. We must now add to that number over two dozen additional studies appearing in the journals of vocational development and counseling The theory provides a straight-forward exposition of theoretical relationships among variables and a well developed instrumentation. Simply stated, it lends itself to test.

As a theory of careers, the relevant literature may be divided into

two areas. The first area is that of vaocational choice -- how people come to choose particular types of occupation in the first place. Much of the literature in this area has dealt with personality and choice of college major, and less often with personality and choice of job (i.e., Yonge and Regan, 1975, and Lucy, 1974). Most of this literature is concerned with the development of vocational interest and focuses on the match between personality and major, or between personality and occupation, usually without considering the subsequent impact on occupational stability. Although some of these studies do look at changes in major fields of study as an index of stability, a comprehensive test of the theory (as a theory of careers) necessitates an investigation of later occupational stability.

The second area of relevant literature does focus directly on occupational stability, but without considering the development of vocational choice. Nafziger et al. (1974) used a representative sample of young men and women age 14 through 24 to test hypotheses derived from Holland's theory concerning the "psychological orderliness of occupational changes, the relationship between occupational experiences and aspirations, and the relationship between consistent occupational codes and the stability of work histories." Holland's occupational classification was directly applied to the Parnes data used in this study, however this data does not contain information necessary for determining respondents' personality profiles independent of their occupations. Likewise, a study by Parsons and Wigtil (1974) examined occupational stability for a representative sample of American men, 45 through 59 years of age. Both of these studies found Holland's classification scheme to be useful for organizing work histories into regular patterns of job changes. However, neither study was able to determine if occupational stability resulted from

the congruence between personality and occupation, a key element in Holland's theory.

The central limitation in tests of Holland's theory has been the absence of a data source which provides both information on individuals' work histories and an independent assessment of personality. Holland's theory predicts that vocational satisfaction and occupational stability depend on the congruence between one's personality and the working environment. The closer the match between personality and occupation, the more likely one is to be satisfied with his or her occupation, and the less likely to change occupations. In the present study we are able to apply a comprehensive test to this theory by investigating these relationships. Our data source provides an assessment of personality derived from Holland's theory, along with corresponding work histories and information on occupational satisfaction. We are also able to investigate college major as a source of vocational adjustment independent of personality.

## PROCEDURES

### Source of Data and Sampling Procedures

The data used in this study are part of a larger data set collected by the National Opinion Research Center as a longitudinal study of the June, 1961 college graduating class; June graduates comprise about three-fourths of all people taking their bachelor's degree in a given academic year. A representative sample of 135 institutions granting the bachelor's degree or its equivalent was drawn. Within each of these 135 institutions, all of which agreed to cooperate with the survey, a sample of students was selected. With appropriate weighting, a sample in which an equal probability of drawing any June, 1961 graduate was achieved[2].

Respondents completed self-administered questionnaires concerning career plans and activities in the spring of their senior year (1961) and in each of the next three years. The original sample included approximately 41,000 respondents with the senior year questionnaire achieving a completion rate of 85 per cent, or about 34,000 cases. Returns for the next three years were 76 per cent, 71 per cent, and 59 per cent, respectively.

In 1968 a 30 per cent subsample of those who had completed all questionnaires for the previous years was drawn, for a sample of 6,005, and of these, 4,868 returned useable questionnaires (81%). In this study we were only concerned with males from the subsample who had not enrolled in graduate school half-time or more[3]. We were thus able to obtain respondent attitude and work histories over the seven-year period following graduation. Information from the 1961 questionnaire was used to determine respondents'

personality type and major field of study. Data from the 1962 questionnaire and the 1968 questionnaire provided information on occupations and job satisfaction. The resulting weighted sample size is 3069[4].

Construction of Variables

Holland's theory of careers states that both people and environments can be classified as six major types and that the degree of incongruity between people and environment is related to occupational stability. We use this typology to classify respondents' personalities, their college majors, and their later occupations. We then constructed our dependent and major independent variables from this classification. The dependent variable measures the degree of match between one's occupation in 1962 and in 1968, while the independent variables calibrate the match between major and occupation in 1962, between personality and major, and between personality and occupation in 1962. Thus the validity with which we can first apply Holland's typology of people and environments to our data is central to the construction of these variables.

I. Holland Codes

The classification of environments by Holland codes is straightforward. We used Holland's (1973) occupational classification to organize and interpret three-digit census codes available in our data for respondents' occupations in 1962 and in 1968. Although Holland's occupational classification supplies three-letter codes, we chose to use only the primary and secondary codes, thus simplifying the construction of our variables. We also assigned two-letter codes to all college major fields of study. This classification was based on the work of Astin (1965, and with Holland, 1961). Several examples of

these environmental classifications should clarify this coding procedure. The three-digit census code, 072, indicates personnel and labor relations work. This code is translated to Holland's occupational classification as "SE", i.e., this is primarily a social environment and secondarily an enterprising one. Likewise, the census code, 296, indicates banking and other finance, which translates to the Holland code, "EC", enterprising and conventional. An example of codes for college majors would then be similar. A major in engineering would be coded, "RI", indicating that the student spent a good bit of his or her time in an environment which was primarily realistic and secondarily, investigative. One also finds in this environment people who are of the realistic-investigative type, and these people are are an important component of the environment.

The classification of respondents into personality types is equally as direct. Holland considers vocational interest to be an expression of personality (1973: 7) and therefore uses interest inventories as a type of personality inventory. The Vocational Preference Inventory (1958, 1965) is composed entirely of occupational titles. Subjects are categorized into personality types according to their statements of preference for the six classes of occupations. Although this means of classification has been expanded in Holland's "Self-directed Search" (1973) to include consideration of "occupational daydreams", "prefered activities" and "competencies", the basic method of classifying respondents remains that of scoring according to statements of occupational preferences. Our data contains such an inventory from which we are able to assign respondents a two-digit code, paralleling that given to environments.

Respondents are given a list of sex groups of occupations (corresponding

to Holland's personality types) and are told that within each group the occupations are similar to each other in many ways. They are then instructed to indicate which two groups they like the most, and which two they like the least. Holland has shown that there are predictable psychological resemblances among the six types of personalities (1973: 23-24). For example, a preference for investigative occupations is closer to a preference for realistic occupations than for those which are classified as artistic. Or, put into a form comparable to responses to our occupational preference question, those who state a preference for investigative occupations should be more likely to indicate a dislike for artistic than for realistic occupations. This leads to a predictable ordering of occupational pairs (occupations liked most, and least) which we compared to the ordering resulting from our inventory. We obtained a rank order correlation of .77, which provides support that our inventory is tapping the same dimensions as proposed by Holland.

II. Match Variables

We constructed our dependent variable and major independent variables according to the degree of match among the two-digit personality, major and occupational Holland codes. A central hypothesis in the theory states that occupational satisfaction and stability depend on the congruence between one's personality and the environment in which one works. The greater the match, the less likely one is to change occupations. Occupational stability is then indicated by the match between one's earlier and later occupational codes. We use the match among these two-digit codes to calibrate respondents' "vocational consistency" and later occupational stability.

There are three measures of vocational consistency in our model,

constructed from the match between personality and major, between personality and occupation in 1962, and between major and occupation in 1962. We used a weighting procedure whereby a perfect match between two-digits codes was assinged a score of 5, and no match between either digit was assigned 0.

Table 1 about here

Table 1 illustrates the scoring for all possible match situations. We also scored the dependent variable, occupational stability, in parallel fashion, constructing it from the match between the Holland codes for 1962 and 1968 occupations.

III. Job satisfaction

Holland predicts that the greater the vocational consistency, the greater the satisfaction with one's occupation. Job satisfaction, or the lack of it, might also account for later occupational stability. Our data include two measures of job satisfaction which refer to respondents' occupations in 1962. The first asks respondents to express their satisfaction with the type of work they do. The second question asks respondents if they would prefer a different job situation (field of work and employer) within one year, if they had the chance to change. Both items were incorporated into a single scale of job satisfaction.

The Model

The various relationships discussed thus far are arrayed in the causal model shown in figure 1. The three match variables, personality/major, personality/occupation, and major/occupation are taken as causes of job

Figure 1 about here

satisfaction and occupational stability. The model implies that the three exogenous variables can affect occupational stability both directly and indirectly via the social psychological measure of job satisfaction. As drawn, the model implies that the relationships will be same across various occupational categories, that is, that the independent variables do not interact with the occupational field which the respondent entered in 1962. This is, in all likelihood, a false assumption because it ignores social structural phenomena that have nothing to do with Holland's theory. The theory assumes that people are free to move from one occupation to another and that they are free to choose occupations and training which are congruent with their personality characteristics. However, changes in the occupational structure and in the demand for various occupations are likely to place constraints on individuals such that they cannot behave in accordance with the theory. For example, students who entered college in 1966 with personality characteristics such that they were ideally suited for high school teaching may well have found that road blocked at the end of their education in 1970. While the theory would then predict that they would move to a field which demanded equivalent characteristics and provided an equivalent environment, the availability of alternate occupations constrains the choices open to the student. Given that there are numerous teachers who are unable to play that role due to lessened demand, fields which emphasize similar characteristics will then be filled rapidly and other fields will not be. At the same time fields which are not chosen will respond with raises in entry wages. The

net result is that these social structural phenomena can well obscure any attempt to test the theory which takes actual job change as its dependent variable.

In order to control for this possibility, at least to some degree, our analysis has been conducted within occupational groups based on Holland's primary classification, that is, the sample has been split on the basis of the first letter of the code assigned to the respondent's 1962 occupation, and the regression equations corresponding to figure 1 have been run within groups. This procedure has the advantage of clearly showing interactions, although it does not provide precise statistical tests of specific interaction terms.

## ANALYSIS AND DISCUSSION

### Results

Table 2 provides basic descriptive data on the relationship of 1962 occupation to personality, measured in 1961, the student's major at college graduation and the student's 1968 occupation. Each column of the table

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Table 2 about here

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corresponds to a primary category of the 1962 occupation. Each horizontal panel corresponds to the primary classification of either personality (row 1 within each panel), major (row 2) or 1968 occupation (row 3). A given entry in the table show the percentage point difference observed in a given 1962 occupational category and the expected proportion of persons in that category assuming persons were assigned at random.

In general, personality characteristics do not have as strong a relationship with 1962 occupation as do major and 1968 occupation. In part, this may reflect the fact that personality is scored somewhat less reliably than major or occupation, but it also reflects students' inability to match their own choices with available jobs and training programs. The match between major and 1962 occupation, on the other hand, is fairly strong with substantial increments to random expectations for jobs that are classified as conventional, artistic and social. Similarly, 1962 and 1968 occupation show relationships well above what would be expected by chance alone, although no single job field has the substantial degree of fit shown between conventional majors

and conventional 1962 occupations, where we find a difference of 62.1 percentage points above random expectation. Still, each field shows a minimum of thirty percentage difference.

In general, these figures lend credence to the theory, or at least credence to the motion that we have defined and coded variables in such a way as to provide a reasonable test of the theory. However, table 1 does not test relative effects, that is, the relationships are bivariate, and it does not allow us to test the role of job satisfaction.

Regression equations with occupational stability as the dependent variable are presented in table 3. As indicated previously, the equations have been run within 1962 primary occupation groups. Within each of the six

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Table 3 about here

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fields, then, we show the raw regression coefficient, (b), the standardized coefficient, (B), standard errors and significance levels (F statistic) for the three match variables and job satisfaction. Other descriptive information on the per cent showing consistent occupations between 1962 and 1968 and the sample sizes within occupational categories are shown at the bottom of the table.

In general these equations show that the variables in question do have some impact on job stability. The overall percentage of variance explained, allowing for the "main effects" of 1962 occupation categories as dummy variables, and the interactions of these categories with other variables in the equation is twenty-two per cent. An equation which does not allow for interaction (see the last column of table 3) only explains sixteen per cent

of the variance, hence we must turn our attention to the within group equations shown with the first six columns of the table.

Here we find that the match between major and occupation is the best single predictor of job stability in three of the six occupational categories and nearly the most important variable in two of the remaining categories. Only in the enterprising category, which shows the lowest explained variance of the six, do we find the match between occupation and major to have somewhat less impact than another variable, in this case the personality/occupation match. The predominance of the major/occupation match may again reflect the comparative unreliability of our personality coding, but it also signifies the degree to which the occupational structure itself reacts to credentials and training, rather than individual characteristics. That is, an individual who finds that his occupation and training do not match may find it easier to move to an occupation where there is a match while an individual who finds himself in a job for which he has been trained but which is not congruent with his personality characteristics may find movement somewhat more difficult. The remaining match variables, personality/major and personality/occupation have somewhat inconsistent effects. Personality/major has significant effects for relaistic and investigative occupations and probably would be found significant in artistic if the sample size were larger, while personality/occupation has substantial effect for the social and enterprising categories, but not elsewhere.

Finally, the effects of job satisfaction are also somewhat inconsistent. For realistic, social and artistic occupations job satisfaction has an impact on job stability; elsewhere it does not. As shown in table 4, job satisfaction itself varies in terms of its predictability. Only in the realistic and

artistic categories do we find at least some variance explained in job satisfaction combined with an effect of job satisfaction on occupational stability. Thus, only in these two categories do we find that job satisfaction plays

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Table 4 about here

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some role in mediating the effects of match variables on occupational stability. On the other hand, job satisfaction, while it has the highest proportion of variance explained in the conventional category, with major/occupation match having the strongest effect, has no effect what so ever on occupational stability, as shown in table 3.

Discussion

These results certainly suggest that the Holland theory provides useful and testable hypotheses with respect to occupational stability. On the other hand, the results are by no means clear. While the theory is elegant and powerful in its simplicity, we fear that the real world is considerably more complicated. We suspect that had the dependent variable been a social psychological measure, eliciting the respondent's "ideal job" in 1968, we might have found cleaner results. However, our measure reflects the real world options open to respondents in terms of labor markets and employers' reactions to educational credentials. We suspect that the different results we obtain within categories of 1962 occupation reflect these factors. A more fruitful approach, perhaps, would be to look at specific occupation which have known labor market characteristics like teaching, engineering, etc.

Table 1. Scheme for calibrating matches in the construction of congruence measures.

Possible Transitions

| two-digit code situation 1 | | two-digit code situation 2 | Score |
|---|---|---|---|
| XY* | ------- | XY | 5 |
| XY | ------- | XZ | 4 |
| XY | ------- | YZ | 3 |
| XY | ------- | ZX | 2 |
| XY | ------- | YZ | |
| XY | ------- | ZY | 1 |
| XY | ------- | ZW | 0 |

*X, Y, Z and W are used to represent all possible unique transitions between two-letter Holland codes.

Figure 1. Model for explaining occupational stability among 1961 male college graduates.

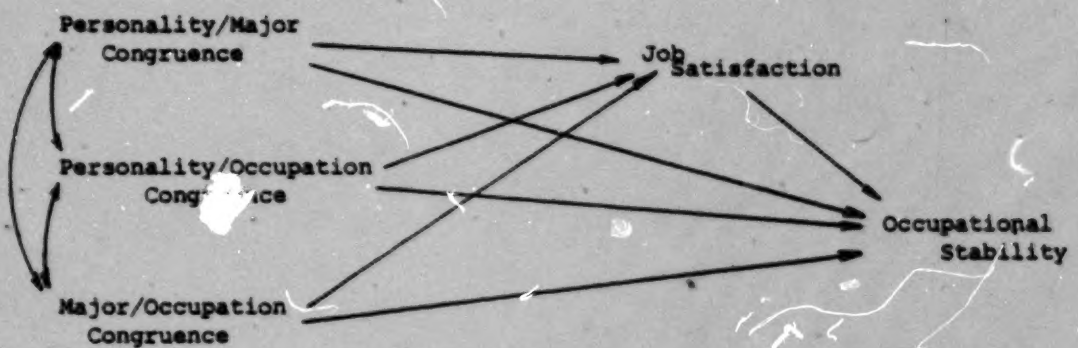

Table 2

Relation of personality type to 1962 occupation type, of major type to 1962 occupation type , and of 1962 occupation type to 1968 occupation type*, 1961 college graduates

| PERSONALITY MAJOR 1968 OCCUPATION | 1962 OCC TYPE R | I | S | C | E | A |
|---|---|---|---|---|---|---|
| REALISTIC | 6.7 | 25.7 | -19.1 | -7.3 | -8.3 | 2.4 |
| | 16.0 | 27.5 | -24.7 | -9.8 | -7.3 | -1.6 |
| | 30.3 | -1.1 | -4.7 | -5.5 | -4.1 | -0.4 |
| INVESTIGATIVE | 2.9 | 18.8 | -8.6 | -5.2 | -7.6 | 1.7 |
| | -2.5 | 36.2 | -11.0 | -9.3 | -9.9 | -3.2 |
| | -0.2 | 41.4 | -13.6 | -17.6 | -12.3 | -15.8 |
| SOCIAL | -1.5 | -13.4 | 22.0 | -4.8 | -2.6 | 0.4 |
| | -6.0 | -19.8 | 41.2 | -6.7 | -9.6 | 0.8 |
| | -14.1 | -24.2 | 46.9 | -16.0 | -18.9 | 5.2 |
| CONVENTIONAL | -7.8 | 4.4 | -17.1 | 8.4 | 6.1 | -3.9 |
| | -10.5 | -16.4 | -21.2 | 62.1 | -9.8 | -4.2 |
| | -7.2 | -5.7 | -3.6 | 37.6 | -3.9 | -7.2 |
| ENTERPRISING | -1.8 | -9.7 | -10.0 | 37.2 | 11.3 | -1.8 |
| | -3.6 | -16.2 | -16.7 | 0.8 | 26.3 | 0.5 |
| | -8.7 | -8.0 | -23.9 | 4.1 | 40.2 | -13.0 |
| ARTISTIC | 11.9 | 15.2 | -10.5 | -4.3 | -6.2 | 4.0 |
| | -5.5 | -21.2 | -7.7 | -8.4 | -13.4 | 40.8 |
| | 0.0 | -2.3 | -1.0 | -1.3 | 11.9 | 31.2 |

*Difference between per cent observed and per cent expected on the assumption of random relationships

Table 3

Regression coefficients for a model explaining occupational stability among 1961 male college graduates

| Independent vars. | | Occupation type R | I | S | C | E | A | Complete sample |
|---|---|---|---|---|---|---|---|---|
| P-M Congruence | b | .165 | .272 | -.157 | .008 | -.005 | .169 | .028 |
| | SE | .075 | .078 | .053 | .108 | .053 | .117 | .030 |
| | B | .135 | .187 | -.139 | .005 | -.004 | .162 | .021 |
| | F | 4.90* | 12.26* | 8.04* | 0.00 | 0.01 | 2.08 | 0.84 |
| P-O Congruence | b | .082 | .146 | .280 | .138 | .214 | -.193 | .249 |
| | SE | .092 | .079 | .051 | .119 | .058 | .149 | .031 |
| | B | .063 | .106 | .269 | .082 | .180 | -.158 | .199 |
| | F | 0.80 | 3.46 | 30.02* | 1.35 | 13.47* | 1.68 | 66.05* |
| M-O Congruence | b | .567 | .312 | .215 | .928 | .138 | .294 | .257 |
| | SE | .065 | .085 | .036 | .120 | .048 | .123 | .026 |
| | B | .562 | .188 | .253 | .490 | .140 | .280 | .225 |
| | F | 76.42* | 13.44* | 36.13* | 59.55* | 8.21* | 5.72* | 100.64* |
| Job Satisfaction | b | .149 | -.032 | .206 | .055 | .066 | .299 | .140 |
| | SE | .057 | .061 | .044 | .070 | .044 | .135 | .024 |
| | B | .150 | -.025 | .188 | .049 | .068 | .250 | .126 |
| | F | 6.87* | 0.27 | 21.56* | 0.61 | 2.22 | 4.88* | 34.54* |
| Adj. $R^2$ | | .429 | .091 | .172 | .296 | .071 | .123 | .160 |
| % Consistent 1962-1968 (1st letter) | | 36.5 | 63.0 | 73.7 | 44.6 | 75.5 | 34.0 | 62.8 |
| Mean Occ. Stability | | 2.78 | 3.22 | 4.06 | 2.76 | 3.66 | 2.93 | 3.44 |
| | sd | 2.00 | 2.20 | 1.58 | 2.28 | 1.78 | 1.69 | 1.97 |
| Sample size | | 200 | 430 | 520 | 228 | 458 | 83 | 1921 |

*Significant at .05 level

Table 4

Regression coefficients for a model explaining job satisfaction among 1961 male college grads.

| Independent vars. | | Occupation type R | I | S | C | E | A | Complete sample |
|---|---|---|---|---|---|---|---|---|
| P-M Congruence | b | -.276 | .075 | .149 | -.024 | .039 | .215 | .004 |
| | SE | .092 | .062 | .055 | .103 | .056 | .094 | .029 |
| | B | -.224 | .065 | .144 | -.016 | .034 | .246 | .030 |
| | F | 9.08* | 1.44 | 7.40* | 0.05 | 0.50 | 5.18* | 1.49 |
| P-O Congruence | b | .376 | .223 | .055 | .295 | .136 | -.326 | .204 |
| | SE | .112 | .062 | .051 | .111 | .061 | .118 | .029 |
| | B | .289 | .206 | .058 | .197 | .111 | -.319 | .181 |
| | F | 11.36* | 12.97* | 1.17 | 7.05* | 4.95* | 7.64* | 49.28* |
| M-O Congruence | b | .098 | .022 | -.012 | .604 | .057 | -.140 | .054 |
| | SE | .081 | .068 | .036 | .107 | .051 | .101 | .025 |
| | B | .097 | .017 | -.015 | .357 | .056 | -.159 | .052 |
| | F | 1.46 | 0.10 | 0.12 | 32.08* | 1.25 | 1.92 | 4.83* |
| Adj. $R^2$ | | .112 | .054 | .026 | .196 | .017 | .135 | .047 |
| Sample size | | 200 | 430 | 520 | 228 | 458 | 83 | 1920 |

*Significant at .05 level

Footnotes

1. This introduction to Holland's theory paraphrases that given by Holland in Making Vocational Choices (1973). See that work for a more extensive discussion of the theory.

2. For a more detailed discussion of sampling procidures, see James A. Davis, Great Aspirations, pp. 278-294.

3. Graduate students and women face different career contingencies which we felt would best be left to separate analyses.

4. Although attrition presents itself as a possible problem, a comparison of those returning questionnaires for the first three years (1961, 1962 and 1963) with those having less complete response records indicated that there was no appreciable bias in the selection of only those with complete response records (Davis, no date).

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